



SEQUENCE LISTING

- <110> Fox Chase Cancer Center
Kruh, Gary D.
Lee, Kun
Belinsky, Martin G.
Bain, Lisa J.
- <120> MRP-Related ABC Transporter Encoding
Nucleic Acids and Methods of Use Thereof
- <130> FCCC 98-02
- <140> 09/647,140
<141> 2001-05-21
- <150> PCT/US99/06644
<151> 1999-03-26
- <150> 60/079,759
<151> 1998-03-27
- <150> 60/095,153
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- <170> FastSEQ for Windows Version 3.0

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<400> 8

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 1395 1400 1405
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<220>
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 <223> d = a, g or t

<220>
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 <222> (18)...(18)
 <223> n = a, c, g or t

<400> 9
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18

<210> 10
 <211> 19
 <212> DNA
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<220>
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99
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<400> 10
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<210> 11
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<220>
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<211> 19
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<212> DNA
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<220>
<221> misc_feature
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<223> n = a, c, g or t

<220>
<221> misc_feature
<222> (6)...(6)
<223> v = a, c or g

<220>
<221> misc_feature
<222> (11)...(11)
<223> s = c or g

<220>
<221> misc_feature
<222> (12)...(12)
<223> w = a or t

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<210> 17
<211> 29
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<220>
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<220>
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<223> y = c or t

<220>
<221> misc_feature
<222> (20)...(20)
<223> h = a, c or t

<220>
<221> misc_feature
<222> (23)...(29)
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<210> 18
 <211> 29
 <212> DNA
 <213> Artificial Sequence

<220>
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 <223> n = a, c, g or t

<220>
 <221> misc_feature
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 <223> r = a or g

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 <223> h = a, c or t

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<210> 19
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<400> 19
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 Phe Gln Asn Thr Val Leu Val Trp Val Pro Cys Phe Tyr Leu Trp Ala
 35 40 45
 Cys Phe Pro Phe Tyr Phe Leu Tyr Leu Ser Arg His Asp Arg Gly Tyr
 50 55 60
 Ile Gln Met Thr Pro Leu Asn Lys Thr Lys Thr Ala Leu Gly Phe Leu
 65 70 75 80
 Leu Trp Ile Val Cys Trp Ala Asp Leu Phe Tyr Ser Phe Trp Glu Arg
 85 90 95
 Ser Arg Gly Ile Phe Leu Ala Pro Val Phe Leu Val Ser Pro Thr Leu
 100 105 110
 Leu Gly Ile Thr Thr Leu Leu Ala Thr Phe Leu Ile Gln Leu Glu Arg
 115 120 125
 Arg Lys Gly Val Gln Ser Ser Gly Ile Met Leu Thr Phe Trp Leu Val
 130 135 140
 Ala Leu Val Cys Ala Leu Ala Ile Leu Arg Ser Lys Ile Met Thr Ala
 145 150 155 160
 Leu Lys Glu Asp Ala Gln Val Asp Leu Phe Arg Asp Ile Thr Phe Tyr
 165 170 175
 Val Tyr Phe Ser Leu Leu Leu Ile Gln Leu Val Leu Ser Cys Phe Ser
 180 185 190
 Asp Arg Ser Pro Leu Phe Ser Glu Thr Ile His Asp Pro Asn Pro Cys
 195 200 205
 Pro Glu Ser Ser Ala Ser Phe Leu Ser Arg Ile Thr Phe Trp Trp Ile

210	Thr	Gly	Leu	Ile	Val	Arg	215	Gly	Tyr	Arg	Gln	Pro	220	Leu	Glu	Gly	Ser	Asp
225	Leu	Trp	Ser	Leu	Asn	Lys	230	Glu	Asp	Thr	Ser	Glu	235	Gln	Val	Val	Pro	240
					245							250					255	
	Leu	Val	Lys	Asn	Trp	Lys	Lys	Glu	Cys	Ala	Lys	Thr	Arg	Lys	Gln	Pro		
			260					265							270			
	Val	Lys	Val	Tyr	Ser	Ser	Lys	Asp	Pro	Ala	Gln	Pro	Lys	Glu	Ser			
		275					280						285					
	Ser	Lys	Val	Asp	Ala	Asn	Glu	Glu	Val	Glu	Ala	Leu	Ile	Val	Lys	Ser		
		290					295					300						
	Pro	Gln	Lys	Glu	Trp	Asn	Pro	Ser	Leu	Phe	Lys	Val	Leu	Tyr	Lys	Thr		
305						310					315					320		
	Phe	Gly	Pro	Tyr	Phe	Leu	Met	Ser	Phe	Phe	Lys	Ala	Ile	His	Asp			
					325					330				335				
	Leu	Met	Met	Phe	Ser	Gly	Pro	Gln	Ile	Leu	Lys	Leu	Leu	Ile	Lys	Phe		
				340					345					350				
	Val	Asn	Asp	Thr	Lys	Ala	Pro	Asp	Trp	Gln	Gly	Tyr	Phe	Tyr	Thr	Val		
		355						360					365					
	Leu	Leu	Phe	Val	Thr	Ala	Cys	Leu	Gln	Thr	Leu	Val	Leu	His	Gln	Tyr		
		370					375					380						
	Phe	His	Ile	Cys	Phe	Val	Ser	Gly	Met	Arg	Ile	Lys	Thr	Ala	Val	Ile		
385						390					395					400		
	Gly	Ala	Val	Tyr	Arg	Lys	Ala	Leu	Val	Ile	Thr	Asn	Ser	Ala	Arg	Lys		
				405						410					415			
	Ser	Ser	Thr	Val	Gly	Glu	Ile	Val	Asn	Leu	Met	Ser	Val	Asp	Ala	Gln		
				420					425					430				
	Arg	Phe	Met	Asp	Leu	Ala	Thr	Tyr	Ile	Asn	Met	Ile	Trp	Ser	Ala	Pro		
		435					440						445					
	Leu	Gln	Val	Ile	Leu	Ala	Leu	Tyr	Leu	Leu	Trp	Leu	Asn	Leu	Gly	Pro		
		450					455					460						
	Ser	Val	Leu	Ala	Gly	Val	Ala	Val	Met	Val	Leu	Met	Val	Pro	Val	Asn		
465					470					475						480		
	Ala	Val	Met	Ala	Met	Lys	Thr	Lys	Thr	Tyr	Gln	Val	Ala	His	Met	Lys		
				485					490						495			
	Ser	Lys	Asp	Asn	Arg	Ile	Lys	Leu	Met	Asn	Glu	Ile	Leu	Asn	Gly	Ile		
			500						505					510				
	Lys	Val	Leu	Lys	Leu	Tyr	Ala	Trp	Glu	Leu	Ala	Phe	Lys	Asp	Lys	Val		
		515					520						525					
	Leu	Ala	Ile	Arg	Gln	Glu	Glu	Leu	Lys	Val	Leu	Lys	Lys	Ser	Ala	Tyr		
		530					535					540						
	Leu	Ser	Ala	Val	Gly	Thr	Phe	Thr	Trp	Val	Cys	Thr	Pro	Phe	Leu	Val		
545						550					555					560		
	Ala	Leu	Cys	Thr	Phe	Ala	Val	Tyr	Val	Thr	Ile	Asp	Glu	Asn	Asn	Ile		
				565					570						575			
	Leu	Asp	Ala	Gln	Thr	Ala	Phe	Val	Ser	Leu	Ala	Leu	Phe	Asn	Ile	Leu		
		580						585						590				
	Arg	Phe	Pro	Leu	Asn	Ile	Leu	Pro	Met	Val	Ile	Ser	Ser	Ile	Val	Gln		
		595					600						605					
	Ala	Ser	Val	Ser	Leu	Lys	Arg	Leu	Arg	Ile	Phe	Leu	Ser	His	Glu	Glu		
		610					615					620						
	Leu	Glu	Pro	Asp	Ser	Ile	Glu	Arg	Arg	Pro	Val	Lys	Asp	Gly	Gly	Gly		
625						630					635					640		
	Thr	Asn	Ser	Ile	Thr	Val	Arg	Asn	Ala	Thr	Phe	Thr	Trp	Ala	Arg	Ser		
				645						650					655			
	Asp	Pro	Pro	Thr	Leu	Asn	Gly	Ile	Thr	Phe	Ser	Ile	Pro	Glu	Gly	Ala		
			660						665					670				
	Leu	Val	Ala	Val	Val	Gly	Gln	Val	Gly	Cys	Gly	Lys	Ser	Ser	Leu	Leu		
		675					680						685					
	Ser	Ala	Leu	Leu	Ala	Glu	Met	Asp	Lys	Val	Glu	Gly	His	Val	Ala	Ile		
		690					695					700						
	Lys	Gly	Ser	Val	Ala	Tyr	Val	Pro	Gln	Gln	Ala	Trp	Ile	Gln	Asn	Asp		
705						710					715					720		
	Ser	Leu	Arg	Glu	Asn	Ile	Leu	Phe	Gly	Cys	Gln	Leu	Glu	Glu	Pro	Tyr		
				725						730					735			
	Tyr	Arg	Ser	Val	Ile	Gln	Ala	Cys	Ala	Leu	Leu	Pro	Asp	Leu	Glu	Ile		

				740				745					750			
Leu	Pro	Ser	Gly	Asp	Arg	Thr	Glu	Ile	Gly	Glu	Lys	Gly	Val	Asn	Leu	
		755					760					765				
Ser	Gly	Gly	Gln	Lys	Gln	Arg	Val	Ser	Leu	Ala	Arg	Ala	Val	Tyr	Ser	
		770					775					780				
Asn	Ala	Asp	Ile	Tyr	Leu	Phe	Asp	Asp	Pro	Leu	Ser	Ala	Val	Asp	Ala	
785					790					795					800	
His	Val	Gly	Lys	His	Ile	Phe	Glu	Asn	Val	Ile	Gly	Pro	Lys	Gly	Met	
				805					810					815		
Leu	Lys	Asn	Lys	Thr	Arg	Ile	Leu	Val	Thr	His	Ser	Met	Ser	Tyr	Leu	
				820					825					830		
Pro	Gln	Val	Asp	Val	Ile	Ile	Val	Met	Ser	Gly	Gly	Lys	Ile	Ser	Glu	
		835					840					845				
Met	Gly	Ser	Tyr	Gln	Glu	Leu	Leu	Ala	Arg	Asp	Gly	Ala	Phe	Ala	Glu	
		850				855					860					
Phe	Leu	Arg	Thr	Tyr	Ala	Ser	Thr	Glu	Gln	Glu	Gln	Asp	Ala	Glu	Glu	
865					870					875					880	
Asn	Gly	Val	Thr	Gly	Val	Ser	Gly	Pro	Gly	Lys	Glu	Ala	Lys	Gln	Met	
				885					890					895		
Glu	Asn	Gly	Met	Leu	Val	Thr	Asp	Ser	Ala	Gly	Lys	Gln	Leu	Gln	Arg	
			900					905					910			
Gln	Leu	Ser	Ser	Ser	Ser	Ser	Tyr	Ser	Gly	Asp	Ile	Ser	Arg	His	His	
		915						920					925			
Asn	Ser	Thr	Ala	Glu	Leu	Gln	Lys	Ala	Glu	Ala	Lys	Lys	Glu	Glu	Thr	
		930				935						940				
Trp	Lys	Leu	Met	Glu	Ala	Asp	Lys	Ala	Gln	Thr	Gly	Gln	Val	Lys	Leu	
945					950					955					960	
Ser	Val	Tyr	Trp	Asp	Tyr	Met	Lys	Ala	Ile	Gly	Leu	Phe	Ile	Ser	Phe	
				965					970					975		
Leu	Ser	Ile	Phe	Leu	Phe	Met	Cys	Asn	His	Val	Ser	Ala	Leu	Ala	Ser	
			980					985					990			
Asn	Tyr	Trp	Leu	Ser	Leu	Trp	Thr	Asp	Asp	Pro	Ile	Val	Asn	Gly	Thr	
		995					1000						1005			
Gln	Glu	His	Thr	Lys	Val	Arg	Leu	Ser	Val	Tyr	Gly	Ala	Leu	Gly	Ile	
		1010					1015					1020				
Ser	Gln	Gly	Ile	Ala	Val	Phe	Gly	Tyr	Ser	Met	Ala	Val	Ser	Ile	Gly	
1025					1030					1035					1040	
Gly	Ile	Leu	Ala	Ser	Arg	Cys	Leu	His	Val	Asp	Leu	Leu	His	Ser	Ile	
				1045					1050					1055		
Leu	Arg	Ser	Pro	Met	Ser	Phe	Phe	Glu	Arg	Thr	Pro	Ser	Gly	Asn	Leu	
			1060					1065					1070			
Val	Asn	Arg	Phe	Ser	Lys	Glu	Leu	Asp	Thr	Val	Asp	Ser	Met	Ile	Pro	
		1075														

Lys	Ala	Arg	Leu	Ser	Leu	Ala	Arg	Ala	Val	Tyr	Ala	Arg	Ala	Asp	Thr
		115					120					125			
Tyr	Leu	Leu	Asp	Asp	Pro	Leu	Ala	Ala	Val	Asp	Glu	His	Val	Ala	Arg
	130					135					140				
His	Leu	Ile	Glu	His	Val										
145					150										

<210> 22
 <211> 161
 <212> PRT
 <213> *Saccharomyces cerevisiae*

<400> 22

Leu	Lys	His	Ile	Asn	Ile	His	Ile	Lys	Pro	Asn	Glu	Lys	Val	Gly	Ile
1				5					10					15	
Val	Gly	Arg	Thr	Gly	Ala	Gly	Lys	Ser	Ser	Leu	Thr	Leu	Ala	Leu	Phe
		20					25					30			
Arg	Met	Ile	Glu	Ala	Ser	Glu	Gly	Asn	Ile	Val	Ile	Asp	Asn	Ile	Ala
		35					40					45			
Ile	Asn	Glu	Ile	Gly	Leu	Tyr	Asp	Leu	Arg	His	Lys	Leu	Ser	Ile	Ile
	50					55				60					
Pro	Gln	Asp	Ser	Gln	Val	Phe	Glu	Gly	Thr	Val	Arg	Glu	Asn	Ile	Asp
65					70				75					80	
Pro	Ile	Asn	Gln	Tyr	Thr	Asp	Glu	Ala	Ile	Trp	Arg	Ala	Leu	Glu	Leu
			85					90					95		
Ser	His	Leu	Lys	Glu	His	Val	Leu	Ser	Met	Ser	Asn	Asp	Gly	Leu	Asp
			100					105					110		
Ala	Gln	Leu	Thr	Glu	Gly	Gly	Gly	Asn	Leu	Ser	Val	Gly	Gln	Arg	Gln
		115					120					125			
Leu	Leu	Cys	Leu	Ala	Arg	Ala	Met	Leu	Val	Pro	Ser	Lys	Ile	Leu	Val
	130					135					140				
Leu	Asp	Glu	Ala	Thr	Ala	Ala	Val	Asp	Val	Glu	Thr	Asp	Lys	Val	Val
145					150					155					160
Gln															

<210> 23
 <211> 150
 <212> PRT
 <213> *Homo Sapiens*

<400> 23

Val	Arg	Asp	Val	Asn	Leu	Asp	Ile	Met	Ala	Gly	Gln	Leu	Val	Ala	Val
1				5					10					15	
Ile	Gly	Pro	Val	Gly	Ser	Gly	Lys	Ser	Ser	Leu	Ile	Ser	Ala	Met	Leu
		20					25					30			
Gly	Glu	Met	Glu	Asn	Val	His	Gly	His	Ile	Thr	Ile	Lys	Gly	Thr	Thr
		35					40					45			
Ala	Tyr	Val	Pro	Gln	Gln	Ser	Trp	Ile	Gln	Asn	Gly	Thr	Ile	Lys	Asp
	50					55				60					
Asn	Ile	Leu	Phe	Gly	Thr	Glu	Phe	Asn	Glu	Lys	Arg	Tyr	Gln	Gln	Val
65					70				75					80	
Leu	Glu	Ala	Cys	Ala	Leu	Leu	Pro	Asp	Leu	Glu	Met	Leu	Pro	Gly	Gly
			85					90					95		
Asp	Leu	Ala	Glu	Ile	Gly	Glu	Lys	Gly	Ile	Asn	Leu	Ser	Gly	Gly	Gln
			100					105					110		
Lys	Gln	Arg	Ile	Ser	Leu	Ala	Arg	Ala	Thr	Tyr	Gln	Asn	Leu	Asp	Ile
		115					120					125			
Tyr	Leu	Leu	Asp	Asp	Pro	Leu	Ser	Ala	Val	Asp	Ala	His	Val	Gly	Lys
	130					135					140				
His	Ile	Phe	Asn	Lys	Val										
145					150										

<210> 24
 <211> 160
 <212> PRT

<213> Homo Sapiens

<400> 24
Leu Arg Gly Ile Thr Cys Asp Ile Gly Ser Met Glu Lys Ile Gly Val
1 5 10 15
Val Gly Arg Thr Gly Ala Gly Lys Ser Ser Leu Thr Asn Cys Leu Phe
20 25 30
Arg Ile Leu Glu Ala Ala Gly Gly Gln Ile Ile Ile Asp Gly Val Asp
35 40 45
Ile Ala Ser Ile Gly Leu His Asp Leu Arg Glu Lys Leu Thr Ile Ile
50 55 60
Pro Gln Asp Pro Ile Leu Phe Ser Gly Ser Leu Arg Met Asn Leu Asp
65 70 75 80
Pro Phe Asn Asn Tyr Ser Asp Glu Glu Ile Trp Lys Ala Leu Glu Leu
85 90 95
Ala His Leu Lys Ser Phe Val Ala Ser Leu Gln Leu Gly Leu Ser His
100 105 110
Glu Val Thr Glu Ala Gly Gly Asn Leu Ser Ile Gly Gln Arg Gln Leu
115 120 125
Leu Cys Leu Gly Arg Ala Leu Leu Arg Lys Ser Lys Ile Leu Val Leu
130 135 140
Asp Glu Ala Thr Ala Ala Val Asp Leu Glu Thr Asp Asn Leu Ile Gln
145 150 155 160

<210> 25

<211> 150

<212> PRT

<213> Homo Sapiens

<400> 25
Leu Lys Asp Ile Asn Phe Lys Ile Glu Arg Gly Gln Leu Leu Ala Val
1 5 10 15
Ala Gly Ser Thr Gly Ala Gly Lys Thr Ser Leu Leu Met Met Ile Met
20 25 30
Gly Glu Leu Glu Pro Ser Glu Gly Lys Ile Lys His Ser Gly Arg Ile
35 40 45
Ser Phe Cys Ser Gln Phe Ser Trp Ile Met Pro Gly Thr Ile Lys Glu
50 55 60
Asn Ile Ile Phe Gly Val Ser Tyr Asp Glu Tyr Arg Tyr Arg Ser Val
65 70 75 80
Ile Lys Ala Cys Gln Leu Glu Glu Asp Ile Ser Lys Phe Ala Glu Lys
85 90 95
Asp Asn Ile Val Leu Gly Glu Gly Gly Ile Thr Leu Ser Gly Gly Gln
100 105 110
Arg Ala Arg Ile Ser Leu Ala Arg Ala Val Tyr Lys Asp Ala Asp Leu
115 120 125
Tyr Leu Leu Asp Ser Pro Phe Gly Tyr Leu Asp Val Leu Thr Glu Lys
130 135 140
Glu Ile Phe Glu Ser Cys
145 150

<210> 26

<211> 159

<212> PRT

<213> Homo Sapiens

<400> 26
Leu Glu Asn Ile Ser Phe Ser Ile Ser Pro Gly Gln Arg Val Gly Leu
1 5 10 15
Leu Gly Arg Thr Gly Ser Gly Lys Ser Thr Leu Leu Ser Ala Phe Leu
20 25 30
Arg Leu Leu Asn Thr Glu Gly Glu Ile Gln Ile Asp Gly Val Ser Trp
35 40 45
Asp Ser Ile Thr Leu Gln Gln Trp Arg Lys Ala Phe Gly Val Ile Pro
50 55 60
Gln Lys Val Phe Ile Phe Ser Gly Thr Phe Arg Lys Asn Leu Asp Pro

<210> 29
 <211> 176
 <212> PRT
 <213> Homo Sapiens

<400> 29
 Leu Ser Asn Ile Thr Ile Arg Ile Pro Arg Gly Gln Leu Thr Met Ile
 1 5 10 15
 Val Gly Gln Val Gly Cys Gly Lys Ser Ser Leu Leu Leu Ala Ala Leu
 20 25 30
 Gly Glu Met Gln Lys Val Ser Gly Ala Val Phe Trp Ser Ser Leu Pro
 35 40 45
 Asp Ser Glu Ile Gly Glu Asp Pro Ser Pro Glu Arg Glu Thr Ala Thr
 50 55 60
 Asp Leu Asp Ile Arg Lys Arg Gly Pro Val Ala Tyr Ala Ser Gln Lys
 65 70 75 80
 Pro Trp Leu Leu Asn Ala Thr Val Glu Glu Asn Ile Thr Phe Glu Ser
 85 90 95
 Pro Phe Asn Lys Gln Arg Tyr Lys Met Val Ile Glu Ala Cys Ser Leu
 100 105 110
 Gln Pro Asp Ile Asp Ile Leu Pro His Gly Asp Gln Thr Gln Ile Gly
 115 120 125
 Glu Arg Gly Ile Asn Leu Ser Gly Gly Gln Arg Gln Arg Ile Ser Val
 130 135 140
 Ala Arg Arg Leu Tyr Gln His Ala Asn Val Val Phe Leu Asp Asp Pro
 145 150 155 160
 Phe Ser Ala Asp Asp Val His Leu Ser Asp His Leu Met Gln Ala Gly
 165 170 175

<210> 30
 <211> 160
 <212> PRT
 <213> Homo Sapiens

<400> 30
 Leu Lys His Val Asn Ala Leu Ile Ser Pro Gly Gln Lys Ile Gly Ile
 1 5 10 15
 Cys Gly Arg Thr Gly Ser Gly Lys Ser Ser Phe Ser Leu Ala Phe Phe
 20 25 30
 Arg Met Val Asp Thr Phe Glu Gly His Ile Ile Ile Asp Gly Ile Asp
 35 40 45
 Ile Arg Lys Leu Pro Leu His Thr Leu Pro Ser Arg Leu Ser Ile Ile
 50 55 60
 Leu Gln Asp Pro Val Leu Phe Ser Gly Thr Ile Arg Phe Asn Leu Asp
 65 70 75 80
 Pro Glu Lys Lys Cys Ser Asp Ser Thr Leu Trp Glu Ala Leu Glu Ile
 85 90 95
 Ala Gln Leu Lys Leu Val Val Lys Ala Leu Pro Gly Gly Leu Asp Ala
 100 105 110
 Ile Ile Thr Glu Gly Gly Glu Asn Phe Ser Gln Gly Gln Arg Gln Leu
 115 120 125
 Phe Cys Leu Ala Arg Ala Phe Val Arg Lys Thr Ser Ile Phe Ile Met
 130 135 140
 Asp Glu Ala Thr Ala Ser Ile Asp Met Ala Thr Glu Asn Ile Leu Gln
 145 150 155 160

<210> 31
 <211> 164
 <212> PRT
 <213> Homo Sapiens

<400> 31
 Ile Lys Gly Leu Asn Leu Lys Val Gln Ser Gly Gln Thr Val Ala Leu
 1 5 10 15

Val	Gly	Asn	Ser	Gly	Cys	Gly	Lys	Ser	Thr	Thr	Val	Gln	Leu	Met	Gln
			20					25					30		
Arg	Leu	Tyr	Asp	Pro	Thr	Glu	Gly	Met	Val	Ser	Val	Asp	Gly	Gln	Asp
		35					40					45			
Ile	Arg	Thr	Ile	Asn	Val	Arg	Phe	Leu	Arg	Glu	Ile	Ile	Gly	Val	Val
	50					55				60					
Ser	Gln	Glu	Pro	Val	Leu	Phe	Ala	Thr	Thr	Ile	Ala	Glu	Asn	Ile	Arg
65					70					75				80	
Tyr	Gly	Arg	Glu	Asn	Val	Thr	Met	Asp	Glu	Ile	Glu	Lys	Ala	Val	Lys
				85				90						95	
Glu	Ala	Asn	Ala	Tyr	Asp	Phe	Ile	Met	Lys	Leu	Pro	His	Lys	Phe	Asp
			100					105					110		
Thr	Leu	Val	Gly	Glu	Arg	Gly	Ala	Gln	Leu	Ser	Gly	Gly	Gln	Lys	Gln
		115				120						125			
Arg	Ile	Ala	Ile	Ala	Arg	Ala	Leu	Val	Arg	Asn	Pro	Lys	Ile	Leu	Leu
	130					135				140					
Leu	Asp	Glu	Ala	Thr	Ser	Ala	Leu	Asp	Thr	Glu	Ser	Glu	Ala	Val	Val
145					150					155					160
Gln	Val	Ala	Leu												

<210> 32
 <211> 163
 <212> PRT
 <213> Homo Sapiens

Leu	Gln	Gly	Leu	Ser	Leu	Glu	Val	Lys	Lys	Gly	Gln	Thr	Leu	Ala	Leu
1				5					10					15	
Val	Gly	Ser	Ser	Gly	Cys	Gly	Lys	Ser	Thr	Val	Val	Gln	Leu	Leu	Glu
			20					25					30		
Arg	Phe	Tyr	Asp	Pro	Leu	Ala	Gly	Lys	Val	Leu	Leu	Asp	Gly	Lys	Glu
		35					40					45			
Ile	Lys	Arg	Leu	Asn	Val	Gln	Trp	Leu	Arg	Ala	His	Leu	Gly	Ile	Val
	50					55				60					
Ser	Gln	Glu	Pro	Ile	Leu	Phe	Asp	Cys	Ser	Ile	Ala	Glu	Asn	Ile	Ala
65					70					75				80	
Tyr	Gly	Asp	Asn	Ser	Arg	Val	Val	Ser	Gln	Glu	Glu	Ile	Val	Arg	Ala
			85					90						95	
Ala	Lys	Glu	Ala	Asn	Ile	His	Ala	Phe	Ile	Glu	Ser	Leu	Pro	Asn	Lys
			100					105					110		
Tyr	Ser	Thr	Lys	Val	Gly	Asp	Lys	Gly	Thr	Gln	Leu	Ser	Gly	Gly	Gln
		115				120						125			
Lys	Gln	Arg	Ile	Ala	Ile	Ala	Arg	Ala	Leu	Val	Arg	Gln	Pro	His	Ile
	130					135				140					
Leu	Leu	Leu	Asp	Glu	Ala	Thr	Ser	Ala	Leu	Asp	Thr	Glu	Ser	Glu	Lys
145					150					155					160
Val	Val	Gln													

<210> 33
 <211> 1530
 <212> PRT
 <213> Homo sapiens

Met	Gly	Pro	Met	Asp	Ala	Leu	Cys	Gly	Ser	Gly	Glu	Leu	Gly	Ser	Lys
1				5					10					15	
Phe	Trp	Asp	Ser	Asn	Leu	Ser	Val	His	Thr	Glu	Asn	Pro	Asp	Leu	Thr
			20					25					30		
Pro	Cys	Phe	Gln	Asn	Ser	Leu	Leu	Ala	Trp	Val	Pro	Cys	Ile	Tyr	Leu
		35					40					45			
Trp	Val	Ala	Leu	Pro	Cys	Tyr	Leu	Leu	Tyr	Leu	Arg	His	His	Cys	Arg
	50					55				60					
Gly	Tyr	Ile	Ile	Leu	Ser	His	Leu	Ser	Lys	Leu	Lys	Met	Val	Leu	Gly
65					70					75					80

Val	Leu	Leu	Trp	Cys	Val	Ser	Trp	Ala	Asp	Leu	Phe	Tyr	Ser	Phe	His
				85					90					95	
Gly	Leu	Val	His	Gly	Arg	Ala	Pro	Ala	Pro	Val	Phe	Phe	Val	Thr	Pro
			100					105					110		
Leu	Val	Val	Gly	Val	Thr	Met	Leu	Leu	Ala	Thr	Leu	Leu	Ile	Gln	Tyr
		115					120					125			
Glu	Arg	Leu	Gln	Gly	Val	Gln	Ser	Ser	Gly	Val	Leu	Ile	Ile	Phe	Trp
	130					135					140				
Phe	Leu	Cys	Val	Val	Cys	Ala	Ile	Val	Pro	Phe	Arg	Ser	Lys	Ile	Leu
145					150					155					160
Leu	Ala	Lys	Ala	Glu	Gly	Glu	Ile	Ser	Asp	Pro	Phe	Arg	Phe	Thr	Thr
				165					170					175	
Phe	Tyr	Ile	His	Phe	Ala	Leu	Val	Leu	Ser	Ala	Leu	Ile	Leu	Ala	Cys
			180					185					190		
Phe	Arg	Glu	Lys	Pro	Pro	Phe	Phe	Ser	Ala	Lys	Asn	Val	Asp	Pro	Asn
	195						200					205			
Pro	Tyr	Pro	Glu	Thr	Ser	Val	Gly	Phe	Leu	Ser	Arg	Leu	Phe	Phe	Trp
	210					215					220				
Trp	Phe	Thr	Lys	Met	Ala	Ile	Tyr	Gly	Tyr	Arg	His	Pro	Leu	Glu	Glu
225					230					235					240
Lys	Asp	Leu	Trp	Ser	Leu	Lys	Glu	Glu	Asp	Arg	Ser	Gln	Met	Val	Val
				245					250					255	
Gln	Gln	Leu	Leu	Glu	Ala	Trp	Arg	Lys	Gln	Glu	Lys	Gln	Thr	Ala	Arg
			260					265					270		
His	Lys	Ala	Ser	Ala	Ala	Pro	Gly	Lys	Asn	Ala	Ser	Gly	Glu	Asp	Glu
	275						280					285			
Val	Leu	Leu	Gly	Ala	Arg	Pro	Arg	Pro	Arg	Lys	Pro	Ser	Phe	Leu	Lys
	290					295					300				
Ala	Leu	Leu	Ala	Thr	Phe	Gly	Ser	Ser	Phe	Leu	Ile	Ser	Ala	Cys	Phe
305					310				315						320
Lys	Leu	Ile	Gln	Asp	Leu	Leu	Ser	Phe	Ile	Asn	Pro	Gln	Leu	Leu	Ser
			325					330						335	
Ile	Leu	Ile	Arg	Phe	Ile	Ser	Asn	Pro	Met	Ala	Pro	Ser	Trp	Trp	Gly
			340					345					350		
Phe	Leu	Val	Ala	Gly	Leu	Met	Phe	Leu	Cys	Ser	Met	Met	Gln	Ser	Leu
		355					360					365			
Ile	Leu	Gln	His	Tyr	Tyr	His	Tyr	Ile	Phe	Val	Thr	Gly	Val	Lys	Phe
	370					375					380				
Arg	Thr	Gly	Ile	Met	Gly	Val	Ile	Tyr	Arg	Lys	Ala	Leu	Val	Ile	Thr
385					390					395					400
Asn	Ser	Val	Lys	Arg	Ala	Ser	Thr	Val	Gly	Glu	Ile	Val	Asn	Leu	Met
			405						410					415	
Ser	Val	Asp	Ala	Gln	Arg	Phe	Met	Asp	Leu	Ala	Pro	Phe	Leu	Asn	Leu
			420					425					430		
Leu	Trp	Ser	Ala	Pro	Leu	Gln	Ile	Ile	Leu	Ala	Ile	Tyr	Phe	Leu	Trp
		435					440					445			
Gln	Asn	Leu	Gly	Pro	Ser	Val	Leu	Ala	Gly	Val	Ala	Phe	Met	Val	Leu
	450					455					460				
Leu	Ile	Pro	Leu	Asn	Gly	Ala	Val	Ala	Val	Lys	Met	Arg	Ala	Phe	Gln
465					470					475					480
Val	Lys	Gln	Met	Lys	Leu	Lys	Asp	Ser	Arg	Ile	Lys	Leu	Met	Ser	Glu
			485						490					495	
Ile	Leu	Asn	Gly	Ile	Lys	Val	Leu	Lys	Leu	Tyr	Ala	Trp	Glu	Pro	Ser
		500						505					510		
Phe	Leu	Lys	Gln	Val	Glu	Gly	Ile	Arg	Gln	Gly	Glu	Leu	Gln	Leu	Leu
		515					520					525			
Arg	Thr	Ala	Ala	Tyr	Leu	His	Thr	Thr	Thr	Thr	Phe	Thr	Trp	Met	Cys
	530					535					540				
Ser	Pro	Phe	Leu	Val	Thr	Leu	Ile	Thr	Leu	Trp	Val	Tyr	Val	Tyr	Val
545					550					555					560
Asp	Pro	Asn	Asn	Val	Leu	Asp	Ala	Glu	Lys	Ala	Phe	Val	Ser	Val	Ser
			565						570					575	
Leu	Phe	Asn	Ile	Leu	Arg	Leu	Pro	Leu	Asn	Met	Leu	Pro	Gln	Leu	Ile
		580						585					590		
Ser	Asn	Leu	Thr	Gln	Ala	Ser	Val	Ser	Leu	Lys	Arg	Ile	Gln	Gln	Phe
		595					600						605		

Leu	Ser	Gln	Glu	Glu	Leu	Asp	Pro	Gln	Ser	Val	Glu	Arg	Lys	Thr	Ile
610						615					620				
Ser	Pro	Gly	Tyr	Ala	Ile	Thr	Ile	His	Ser	Gly	Thr	Phe	Thr	Trp	Ala
625					630					635					640
Gln	Asp	Leu	Pro	Pro	Thr	Leu	His	Ser	Leu	Asp	Ile	Gln	Val	Pro	Lys
				645					650					655	
Gly	Ala	Leu	Val	Ala	Val	Val	Gly	Pro	Val	Gly	Cys	Gly	Lys	Ser	Ser
			660					665					670		
Leu	Val	Ser	Ala	Leu	Leu	Gly	Glu	Met	Glu	Lys	Leu	Glu	Gly	Lys	Val
		675				680						685			
His	Met	Lys	Gly	Ser	Val	Ala	Tyr	Val	Pro	Gln	Gln	Ala	Trp	Ile	Gln
690						695				700					
Asn	Cys	Thr	Leu	Gln	Glu	Asn	Val	Leu	Phe	Gly	Lys	Ala	Leu	Asn	Pro
705					710					715					720
Lys	Arg	Tyr	Gln	Gln	Thr	Leu	Glu	Ala	Cys	Ala	Leu	Leu	Ala	Asp	Leu
			725					730						735	
Glu	Met	Leu	Pro	Gly	Gly	Asp	Gln	Thr	Glu	Ile	Gly	Glu	Lys	Gly	Ile
			740					745					750		
Asn	Leu	Ser	Gly	Gly	Gln	Arg	Gln	Arg	Val	Ser	Leu	Ala	Arg	Ala	Val
			755				760					765			
Tyr	Ser	Asp	Ala	Asp	Ile	Phe	Leu	Leu	Asp	Asp	Pro	Leu	Ser	Ala	Val
770						775					780				
Asp	Ser	His	Val	Ala	Lys	His	Ile	Phe	Asp	His	Val	Ile	Gly	Pro	Glu
785					790					795					800
Gly	Val	Leu	Ala	Gly	Lys	Thr	Arg	Val	Leu	Val	Thr	His	Gly	Ile	Ser
				805					810					815	
Phe	Leu	Pro	Gln	Thr	Asp	Phe	Ile	Ile	Val	Leu	Ala	Asp	Gly	Gln	Val
			820					825					830		
Ser	Glu	Met	Gly	Pro	Tyr	Pro	Ala	Leu	Leu	Gln	Arg	Asn	Gly	Ser	Phe
		835					840					845			
Ala	Asn	Phe	Leu	Cys	Asn	Tyr	Ala	Pro	Asp	Glu	Asp	Gln	Gly	His	Leu
		850				855					860				
Glu	Asp	Ser	Trp	Thr	Ala	Leu	Glu	Gly	Ala	Glu	Asp	Lys	Glu	Ala	Leu
865					870					875					880
Leu	Ile	Glu	Asp	Thr	Leu	Ser	Asn	His	Thr	Asp	Leu	Thr	Asp	Asn	Asp
				885					890					895	
Pro	Val	Thr	Tyr	Val	Val	Gln	Lys	Gln	Phe	Met	Arg	Gln	Leu	Ser	Ala
			900					905					910		
Leu	Ser	Ser	Asp	Gly	Glu	Gly	Gln	Gly	Arg	Pro	Val	Pro	Arg	Arg	His
			915				920					925			
Leu	Gly	Pro	Ser	Glu	Lys	Val	Gln	Val	Thr	Glu	Ala	Lys	Ala	Asp	Gly
		930				935					940				
Ala	Leu	Thr	Gln	Glu	Glu	Lys	Ala	Ala	Ile	Gly	Thr	Val	Glu	Leu	Ser
945					950					955					960
Val	Phe	Trp	Asp	Tyr	Ala	Lys	Ala	Val	Gly	Leu	Cys	Thr	Thr	Leu	Ala
				965					970					975	
Ile	Cys	Leu	Leu	Tyr	Val	Gly	Gln	Ser	Ala	Ala	Ala	Ile	Gly	Ala	Asn
			980					985					990		
Val	Trp	Leu	Ser	Ala	Trp	Thr	Asn	Asp	Ala	Met	Ala	Asp	Ser	Arg	Gln
		995					1000					1005			
Asn	Asn	Thr	Ser	Leu	Arg	Leu	Gly	Val	Tyr	Ala	Ala	Leu	Gly	Ile	Leu
		1010				1015					1020				
Gln	Gly	Phe	Leu	Val	Met	Leu	Ala	Ala	Met	Ala	Met	Ala	Ala	Gly	Gly
1025					1030					1035					1040
Ile	Gln	Ala	Ala	Arg	Val	Leu	His	Gln	Ala	Leu	Leu	His	Asn	Lys	Ile
				1045					1050					1055	
Arg	Ser	Pro	Gln	Ser	Phe	Phe	Asp	Thr	Thr	Pro	Ser	Gly	Arg	Ile	Leu
			1060					1065					1070		
Asn	Cys	Phe	Ser	Lys	Asp	Ile	Tyr	Val	Val	Asp	Glu	Val	Leu	Ala	Pro
			1075				1080					1085			
Val	Ile	Leu	Met	Leu	Leu	Asn	Ser	Phe	Phe	Asn	Ala	Ile	Ser	Thr	Leu
			1090			1095					1100				
Val	Val	Ile	Met	Ala	Ser	Thr	Pro	Leu	Phe	Thr	Val	Val	Ile	Leu	Pro
1105					1110					1115					1120
Leu	Ala	Val	Leu	Tyr	Thr	Leu	Val	Gln	Arg	Phe	Tyr	Ala	Ala	Thr	Ser
				1125					1130					1135	

Arg Gln Leu Lys Arg Leu Glu Ser Val Ser Arg Ser Pro Ile Tyr Ser
 1140 1145 1150
 His Phe Ser Glu Thr Val Thr Gly Ala Ser Val Ile Arg Ala Tyr Asn
 1155 1160 1165
 Arg Ser Arg Asp Phe Glu Ile Ile Ser Asp Thr Lys Val Asp Ala Asn
 1170 1175 1180
 Gln Arg Ser Cys Tyr Pro Tyr Ile Ile Ser Asn Arg Trp Leu Ser Ile
 1185 1190 1195 1200
 Gly Val Glu Phe Val Gly Asn Cys Val Val Leu Phe Ala Ala Leu Phe
 1205 1210 1215
 Ala Val Ile Gly Arg Ser Ser Leu Asn Pro Gly Leu Val Gly Leu Ser
 1220 1225 1230
 Val Ser Tyr Ser Leu Gln Val Thr Phe Ala Leu Asn Trp Met Ile Arg
 1235 1240 1245
 Met Met Ser Asp Leu Glu Ser Asn Ile Val Ala Val Glu Arg Val Lys
 1250 1255 1260
 Glu Tyr Ser Lys Thr Glu Thr Glu Ala Pro Trp Val Val Glu Gly Ser
 1265 1270 1275 1280
 Arg Pro Pro Glu Gly Trp Pro Pro Arg Gly Glu Val Glu Phe Arg Asn
 1285 1290 1295
 Tyr Ser Val Arg Tyr Arg Pro Gly Leu Asp Leu Val Leu Arg Asp Leu
 1300 1305 1310
 Ser Leu His Val His Gly Gly Glu Lys Val Gly Ile Val Gly Arg Thr
 1315 1320 1325
 Gly Ala Gly Lys Ser Ser Met Thr Leu Cys Leu Phe Arg Ile Leu Glu
 1330 1335 1340
 Ala Ala Lys Gly Glu Ile Arg Ile Asp Gly Leu Asn Val Ala Asp Ile
 1345 1350 1355 1360
 Gly Leu His Asp Leu Arg Ser Gln Leu Thr Ile Ile Pro Gln Asp Pro
 1365 1370 1375
 Ile Leu Phe Ser Gly Thr Leu Arg Met Asn Leu Asp Pro Phe Gly Ser
 1380 1385 1390
 Tyr Ser Glu Glu Asp Ile Trp Trp Ala Leu Glu Leu Ser His Leu His
 1395 1400 1405
 Thr Phe Val Ser Ser Gln Pro Ala Gly Leu Asp Phe Gln Cys Ser Glu
 1410 1415 1420
 Gly Gly Glu Asn Leu Ser Val Gly Gln Arg Gln Leu Val Cys Leu Ala
 1425 1430 1435 1440
 Arg Ala Leu Leu Arg Lys Ser Arg Ile Leu Val Leu Asp Glu Ala Thr
 1445 1450 1455
 Ala Ala Ile Asp Leu Glu Thr Asp Asn Leu Ile Gln Ala Thr Ile Arg
 1460 1465 1470
 Thr Gln Phe Asp Thr Cys Thr Val Leu Thr Ile Ala His Arg Leu Asn
 1475 1480 1485
 Thr Ile Met Asp Tyr Thr Arg Val Leu Val Leu Asp Lys Gly Val Val
 1490 1495 1500
 Ala Glu Phe Asp Ser Pro Ala Asn Leu Ile Ala Ala Arg Gly Ile Phe
 1505 1510 1515 1520
 Tyr Gly Met Ala Arg Asp Ala Gly Leu Ala
 1525 1530

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